

ASSESSING THE EFFECTS OF MONETARY POLICY AND INTERNATIONAL TRADE ON ECONOMIC GROWTH IN NIGERIA

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ABSTRACT

This study examines the impact of monetary policy and international trade on economic growth in Nigeria using the Quantile Autoregressive Distributed Lag (QARDL) model. The analysis covers quarterly time series data from 1990Q1 to 2023Q4, exploring the effects of key macroeconomic variables across different economic growth levels. The findings reveal that international trade, exchange rate stability, and money supply expansion positively impact economic growth in both the short run and long run. However, interest rates and monetary policy rates exhibit non-linear effects, with high interest rates negatively impacting economic growth, particularly at higher quantiles. The error correction model (ECM) confirms a stable long-run equilibrium, with varying speeds of adjustment across economic growth levels. The study concludes that international trade, exchange rate stability, and controlled monetary expansion are critical determinants of economic growth in Nigeria. While trade liberalization and exchange rate stability promote long-term growth, excessive reliance on contractionary monetary policy, particularly high-interest rates, may suppress investment and economic activity. The study also recommends that policymakers should implement gradual trade liberalization measures, maintain stable exchange rates, and adopt flexible monetary policies to avoid excessive interest rate hikes that could hinder investment and consumption. These findings provide valuable insights for designing policies that foster sustainable economic growth in Nigeria.

Keywords: Monetary policy; International trade; Economic growth; QARDL model; Nigeria

JEL Codes: E52; F14; F43; C22; O40.

1. Introduction

Monetary policy continues to play a pivotal role in promoting macroeconomic stability and sustaining long-term economic growth, particularly in open economies where domestic performance is closely linked to external developments (Judijanto, Harsono, Ro'is, & Mulawiani, 2024; Chinedu, Magaji, & Musa, 2021). Across both developed and developing countries, the pursuit of sustainable growth, price stability, and external balance remains a central objective of monetary and trade policies alike (Adegboyo, Keji, & Fasina, 2021). In this regard, monetary policy is not only expected to regulate domestic economic conditions, but also to create an enabling environment for productive trade and investment activities.

To achieve these macroeconomic objectives, monetary authorities typically target key intermediate variables such as money supply, exchange rate, and short-term interest rates (Dua, 2023; Musa, Magaji, & Salisu, 2022). Among these variables, exchange rate stability occupies a particularly important position because of its direct influence on external competitiveness, trade flows, inflation dynamics, and overall domestic economic performance. For a developing economy such as Nigeria, whose economic structure is significantly connected to global markets, the sustainability of international trade is essential for supporting economic growth while maintaining relative price stability (UNCTAD, 2019). International trade enhances economic performance through greater market access, specialisation, technological diffusion, and improved transport and information systems. Nevertheless, the benefits of trade may be undermined when import growth consistently outpaces export expansion, thereby weakening domestic production capacity and slowing economic progress (Ijirshar, 2019).

Despite the theoretical importance of monetary policy and international trade in stimulating real-sector growth, empirical evidence on their effectiveness remains inconclusive. Monetary policy affects economic activity through several transmission channels, including money supply, interest rates, and credit availability. Consequently, understanding the effectiveness and relative strength of these channels is crucial for policymakers seeking to achieve favourable macroeconomic outcomes (Hameed, Bibi, & Hassan, 2023). Within this framework, monetary authorities rely on policy instruments to influence broader macroeconomic targets such as economic development, price stability, employment generation, and balance of payments equilibrium (African Development Bank, 2023).

In Nigeria, however, the expected gains from monetary policy and international trade have not fully translated into sustained economic growth and structural transformation. Although the country is richly endowed with natural resources and remains actively integrated into the global trading system, economic growth has continued to fluctuate over time. Nigeria derives nearly 95% of its foreign exchange earnings from crude oil exports, while the oil sector contributes substantially to national output and export earnings, accounting for approximately 80% of GDP and about 90% of total exports valued at nearly \$47.8 billion (World Bank, 2023). Notwithstanding these considerable resource advantages, the economy remains highly vulnerable to external shocks, persistent inflationary pressures, and structural rigidities that constrain long-term growth and development.

A major concern relates to the weak transmission mechanism of monetary policy in Nigeria. Despite several interventions by the Central Bank of Nigeria aimed at controlling inflation and stabilising the macroeconomic, the effectiveness of monetary policy has remained relatively limited. Inflationary pressures continue to persist, while fluctuations in interest rates discourage productive investment and undermine private sector confidence. Similarly, weak management of price volatility has reduced the capacity of monetary policy to deliver the level of macroeconomic stability required for sustainable economic growth. These challenges are further intensified by the structure of Nigeria's international trade sector. Although the country occasionally records trade surpluses for instance, a surplus of approximately \$2.8 billion in June 2024 compared with \$1.2 billion in 2023 (CEIC, 2024) the overall trade balance remains unstable due to excessive dependence on crude oil exports. This dependence exposes the economy to fluctuations in global oil prices and external market conditions. At the same time,

rising import dependence and limited diversification of non-oil exports continue to weaken the growth-enhancing potential of international trade. Consequently, rather than serving as a stabilising force, trade dynamics have often amplified existing macroeconomic vulnerabilities within the Nigerian economy.

Against this background, this study investigates the effect of monetary policy and international trade on economic growth in Nigeria, with particular emphasis on the roles of interest rate and exchange rate in shaping economic performance. By examining the interaction between these macroeconomic variables, the study seeks to provide empirical evidence that can contribute to more effective policy formulation aimed at achieving sustainable growth and macroeconomic stability in Nigeria.

The remainder of the paper is structured as follows. Section Two presents the literature review and empirical review. Section Three discusses the methodology adopted for the study, while Section Four presents and discusses the empirical findings. Finally, Section Five concludes the study and provides relevant policy implications.

2. Literature Review

2.1 Conceptual Literature

Concept of Monetary Policy

Monetary policy refers to the actions taken by a country's central bank or monetary authority to regulate the supply, cost, and availability of money and credit in order to achieve economic stability and promote growth (Saran, 2014). It mainly operates through the control of interest rates and money supply, which in turn influence inflation, unemployment, exchange rates, and overall economic performance. The Central Bank of Nigeria (CBN, 2022; 2023) defines monetary policy as a set of measures used to manage the quantity, value, and cost of money in line with expected economic activity. Similarly, Jhingan (2002), Nwankwo (1991), Wrightsman (1976), Okwo (2012), and Ogunjimi (1997) all emphasise that monetary policy involves central bank actions aimed at controlling credit conditions, banking operations, money circulation, and interest rates to achieve macroeconomic objectives. However, Abeng (2006) notes that the effectiveness of monetary policy depends on the level of monetisation in an economy. In less developed economies with large subsistence sectors, its impact may be limited because significant economic activity occurs outside the formal financial system.

Concept of International Trade

International trade involves the exchange of goods, services, and capital between countries and is explained by several economic theories, including absolute advantage (Smith, 1776), comparative advantage (Ricardo, 1817), factor endowments (Heckscher-Ohlin), and modern approaches such as New Trade Theory (Krugman & Obstfeld, 1991). These theories collectively show that trade is driven by differences in productivity, resources, scale economies, and global integration. Kling (2012) highlights differences in perception between

economists and the general public, particularly the belief that exports are preferable to imports and that trade balances depend mainly on competitiveness. Economists, however, view all voluntary trade as beneficial and influenced by multiple factors including savings and investment patterns. In this study, international trade refers to Nigeria's export and import activities and its integration into the global economy. It is measured using indicators such as total trade volume, exports, imports, and trade openness (trade-to-GDP ratio), which are used to assess its effect on economic growth.

Concept of Economic Growth

Economic growth refers to a sustained increase in an economy's output of goods and services over time, usually measured by real GDP or GDP per capita (Swan, 1956; Acemoglu, 2012). It is driven by improvements in productivity, technology, and factor inputs, leading to higher living standards (Palmer, 2012). Scholars distinguish economic growth from economic development. While growth focuses on increased output, development includes broader improvements such as better living conditions, education, health, and institutional quality (Todaro, 2009; Woodford & Smith, 2000). Growth is commonly classified as intensive (productivity-driven) or extensive (input-driven) (Bjork, 1999). Overall, it reflects a country's expanding capacity to produce goods and services and is closely linked to improvements in national income and welfare (Okolie & Oleka, 2007).

2.2 Review of Empirical Literature

Empirical studies have consistently shown that monetary policy and international trade play important roles in shaping economic performance. Much of the existing literature argues that the achievement of macroeconomic objectives depends largely on effective policy coordination and the proper management of policy instruments. In this regard, several scholars have emphasised the importance of coordinating fiscal and monetary policies in order to maintain macroeconomic stability and stimulate growth (Atuma & Eze, 2018; Inimino et al., 2019; Rahmon & Adefunke, 2019; Sakanko & Akim, 2021). Monetary policy, in particular, is widely regarded as an effective tool for correcting short-run macroeconomic imbalances because its instruments can be adjusted relatively quickly. It also plays a crucial role in maintaining exchange rate stability and promoting economic growth.

In a study of selected ASEAN countries, namely Indonesia, Malaysia, the Philippines, and Thailand, Astuti and Udjianto (2022) investigated the effects of monetary policy and international trade on economic growth and inflation. Their findings revealed that monetary policy exerts a negative effect on economic growth in the short run but produces a positive effect over the long run. The study further showed that interest rates influence inflation through price volatility, while foreign trade contributes positively to inflationary pressures. This suggests that rising exports may increase aggregate demand and, consequently, the general

price level. Based on these findings, the authors stressed the importance of coordinating monetary policy with activities in the real sector in order to improve policy effectiveness.

Similarly, Uzoma and Odungweru (2021) examined the relationship between monetary policy and international trade in Nigeria over the period 1980–2017. Using total trade as a proxy for international trade, the study considered several macroeconomic policy variables, including interest rate, money supply, inflation, exchange rate, minimum discount rate, and cash reserve ratio. The results confirmed the existence of a long-run relationship among the variables. Specifically, exchange rate was found to have a positive and significant impact on trade in the long run, whereas the minimum discount rate exerted a significant negative effect. Consequently, the authors recommended a reduction in the minimum discount rate and advised against further depreciation of the naira in order to sustain exchange rate stability.

Adegboyo (2020) investigated the combined effects of monetary, trade, and fiscal policies on economic development in Nigeria between 1985 and 2020. The study established the presence of cointegration among the variables, while the ARDL estimates indicated that economic growth responds positively to fiscal policy measures but negatively to trade policy variables. On the basis of these findings, the study recommended strengthening fiscal policy as a means of supporting sustainable economic growth.

In another related study, Adediran et al. (2019) examined the role of monetary policy in mitigating external credit shocks in Nigeria during the period 1980–2015. Adopting a Cobb–Douglas production framework alongside cointegration and ARDL techniques, the study found evidence of a long-run relationship among the variables. The findings further revealed that the Nigerian economy remains highly vulnerable to external credit shocks. As a result, the authors advocated structural reforms in monetary policy to reduce the adverse effects of such external disturbances.

A number of other empirical studies have also explored the broader links between trade, monetary policy, and economic growth. For instance, Zhimin Li (2018) analysed the relationship between international trade and economic growth during China's economic transition, with particular attention to structural transformation and exchange rate movements. In Nigeria, Ashamu (2018) investigated the relationship between bank lending and monetary policy in deposit money banks over the period 1981–2015 using the Vector Error Correction Model (VECM). The study highlighted the critical role of the banking sector in economic growth and recommended appropriate regulatory adjustments to enhance monetary policy transmission. Likewise, Ajayi and Aluko (2017), employing the ARDL approach, found that money supply, government expenditure, and government revenue significantly influence economic growth in Nigeria. Nwoko et al. (2016), using the Ordinary Least Squares (OLS) technique for the period 1990–2011, reported that average price levels and labour force

significantly affect Gross Domestic Product (GDP), while interest rate maintains a negative but statistically significant relationship with economic growth.

More broadly, the literature on monetary policy and economic growth is extensive. Several studies, including Dauda and Abdulkareem (2023), Musa and Idris (2023), Adeleke and Ayodeji (2021), Okoroafor and Udude (2020), Cecilia, Okoye, and Molokwu (2019), Andabai, Ikeora, and Anah (2019), Eugene (2019), Ezeaku and Ezejiofor (2019), Oji and Chukwu (2018), Aliyu (2018), Aliyu and Dauda (2017), and Agbokhese and Asekone (2016), have examined different dimensions of monetary policy and economic performance. However, despite the richness of the literature, many of these studies pay limited attention to the role of international trade in shaping the relationship between monetary policy and economic growth. This omission creates an important gap in the literature and provides the motivation for the present study.

In addition to the identified empirical gap, there is also a methodological concern in the existing literature. Most previous studies have relied heavily on conventional econometric techniques such as OLS, VAR, VECM, ARDL, and SVAR (Dauda & Abdulkareem, 2023; Fasanya et al., 2013; Adegbite & Alabi, 2013; Andabai et al., 2019; Clyone et al., 2020; Cecilia et al., 2019; Musa & Idris, 2023). While these methods are widely accepted, they often produce mixed findings because they may not adequately capture variations across different levels of economic performance. To address this limitation, the present study adopts the Quantile Autoregressive Distributed Lag (QARDL) model. This approach makes it possible to examine how the effects of monetary policy differ across various quantiles of economic performance and under different trade conditions.

3. Methodology

3.1 Theoretical Framework

This study adopted the Quantity Theory of Money, originally developed by classical economists such as Irving Fisher (1911) and later supported in various forms by David Hume (1752) and the Cambridge economists (Marshall and Pigou, early 20th century), provides a foundational explanation of the relationship between money supply, price levels, and economic activity. It is commonly expressed through Fisher's equation of exchange:

$$MV = PQ \tag{1}$$

Where M represents money supply, V is the velocity of money, P is the price level, and Q is real output. The theory posits that nominal GDP (PQ) is determined by the quantity of money in circulation and how frequently it is used in transactions (Okonkwo et al., 2015). In its core argument, the theory suggests that an increase in money supply, if not matched by a corresponding increase in output, leads to inflation. This relationship has influenced modern monetary policy frameworks, particularly inflation targeting strategies adopted by central banks, where instruments such as interest rate adjustments and open market operations are used to regulate inflation (Okoroafor & Udude, 2020). While the theory also implies a link between

price stability and long-term economic growth, it is mainly applied to explain inflation dynamics. However, the theory is criticised for assuming a constant velocity of money and for ignoring key real-sector and institutional factors that influence economic performance, especially in developing economies like Nigeria. These limitations reduce its explanatory power in the short run, although it remains relevant for understanding long-run monetary relationships.

3.2 Sources of Data and Measurement of Variables

This study makes use of a time series dataset covering the period 1990 to 2023 to examine the impact of monetary policy and international trade on economic growth in Nigeria. The variables used in the analysis include the interest rate (INT), exchange rate (EXR), and monetary policy rate (MPR), all of which were obtained from the Central Bank of Nigeria (CBN, 2024). Data on Real Gross Domestic Product (RGDP) and broad money supply (M2) were sourced from the World Development Indicators (2024), while data on international trade (ITR) were obtained from the International Monetary Fund (IMF, 2024).

3.2 Model Specification

This study builds on the model employed by Ugwu (2024), which itself is grounded in the monetary policy–economic growth framework originally developed by Lee and Park (2000). However, the present study departs from the earlier formulation in a number of ways. First, it applies the Quantile Autoregressive Distributed Lag (QARDL) technique, which allows for a more nuanced examination of relationships across different points of the economic growth distribution. Second, it introduces international trade (ITR) as an additional explanatory variable, thereby broadening the scope of the model. The selection of variables is guided by both theoretical foundations and empirical evidence from prior studies. The functional form of the model is specified as follows:

$$RGDP_t = f(INT_t, ITR_t, EXR_t, M2_t, MPR_t) \quad (2)$$

Where $RGDP_t$ represent Real gross domestic product, INT_t denotes Interest rate, ITR_t signifies International Trade, EXR_t denotes Exchange rate, $M2_t$ captures Broad money supply, MPR_t signifies monetary policy rate, t . represent time period.

The econometric form of the aforementioned functional specification is as follows:

$$RGDP_t = \beta_0 + \beta_1 INT_t + \beta_2 ITR_t + \beta_3 EXR_t + \beta_4 M2_t + \beta_5 MPR_t + \varepsilon_t \quad (3)$$

Where ε_t is the error term or white noise, t represents time period and $\beta_1 - \beta_5$ are parameter estimates.

Consequently, this study employs the Quantile Autoregressive distributive lag (QNARDL) Model developed by Cho et al. (2015).

The study specify the QARDL(p,q) following the model developed by Cho et al., (2015) is as follow:

$$QRGDP_t = \beta(\gamma) + \sum_{l=1}^P \beta_1(\gamma) RGD P_{t-1} + \sum_{i=0}^{q1} \beta_2(\gamma) INT_{t-1} + \sum_{i=0}^{q2} \beta_3(\gamma) ITR_{t-1} \\ + \sum_{i=0}^{q3} \beta_4(\gamma) EXR_{t-1} + \sum_{i=0}^{q4} \beta_5(\gamma) M2_{t-1} + \sum_{i=0}^{q4} \beta_5(\gamma) MPR_{t-1} + \varepsilon_t(\gamma) \quad (4)$$

Where $\varepsilon_t(\tau) = RGD P_t - QRGD P_t(\gamma/\varepsilon_{t-i})$ and $0 < \gamma < 1$ is the quantile.

In the equation (4), estimate; t refer to time period, respectively; $\sum_{l=1}^P \beta_1$ the difference operator; $\beta_1, \beta_2, \beta_3, \beta_4$, and β_5 , are long run coefficients.

$$QRGDP_t = \beta(\gamma) + \sum_{l=1}^P \alpha_{1RGD P}(\gamma) \Delta RGD P_{t-1} + \tau_{RGD P}(\gamma) RGD P_t \sum_{i=0}^{q1} \alpha_{INT}(\gamma) \Delta INT_{t-1} \\ + \tau_{INT}(\gamma) INT_t + \sum_{i=0}^{q2} \alpha_3(\gamma) \Delta ITR_{t-1} + \tau_{ITR}(\gamma) ITR_t \\ + \sum_{i=0}^{q3} \alpha_{EXR}(\gamma) \Delta EXR_{t-1} + \tau_{EXR}(\gamma) EXR_t + \sum_{i=0}^{q4} \alpha_{M2}(\gamma) \Delta M2_{t-1} + \tau_{M2}(\gamma) M2_t \\ + \sum_{i=0}^{q4} \alpha_{MPR}(\gamma) \Delta MPR_{t-1} + \tau_{MPR}(\gamma) MPR_t + \varepsilon_t(\gamma) \quad (5)$$

The parameters in equation (4) capture the short-run effects of the relationship between capital formation and the regressors. The long-run effects are obtained by reworking equation (5) as follows:

$$QRGDP_t = \varepsilon(\gamma) + X_t(\alpha) + M_t(\gamma) \quad (6)$$

Where X is the vector of regressors (INT, ITR, EXR, M2, MPR)

4. Results and Discussion

Table 4.1 Descriptive Statistics

Variable	RGDP	INT	ITR	EXR	M2	MPR
Mean	4.682	4.123	1.622	13.821	18.801	5.152
Median	4.595	4.184	2.074	13.503	12.476	0.981
Maximum	10.806	6.026	2.958	26.704	73.102	53.608
Minimum	0.006	2.377	-0.247	6.003	-4.986	0.135
Std. dev	1.466	1.020	0.882	3.787	16.283	10.324
Skewness	0.808	-0.169	-0.815	0.538	1.593	3.137
Kurtosis	5.119	1.931	2.493	3.999	4.600	12.680
Jarque–Bera	50.301	9.055	20.912	15.003	91.134	95.689

Probability	0.128	0.115	0.295	0.057	0.776	0.948
Sum	8062	7094	2793	2376	3233	8862
Obs	132	132	132	132	132	132

Source: Researcher`s computation (2025)

Table 4.1 presents a clear summary of the descriptive statistics for the key macroeconomic variables based on 132 observations. Real GDP (RGDP), used as a proxy for economic growth, records an average value of 4.682, suggesting a generally moderate growth performance over the study period. However, the wide range between the maximum value (10.806) and the minimum value (0.006) points to considerable fluctuations in economic activity. Its standard deviation of 1.466 further confirms a moderate level of variation around the mean. International trade (INT), measured by trade openness, has an average value of 4.123, indicating a fairly moderate level of trade engagement. Compared to RGDP, it shows less dispersion, with values ranging from 2.377 to 6.026 and a relatively low standard deviation of 1.020. This suggests that trade openness remained more stable over time. Interest rates (ITR) average 1.622, reflecting generally low rates within the period. The presence of a negative minimum value (-0.247) is noteworthy, as it suggests periods of unconventional monetary conditions. With a maximum of 2.958 and a standard deviation of 0.882, interest rates show moderate variability overall. Finally, the exchange rate (EXR) records an average value of 13.821, indicating noticeable movements in the value of the domestic currency. The wide spread between its maximum (26.704) and minimum (6.003), alongside a standard deviation of 3.787, highlights significant volatility in the exchange rate over the period.

4.2 Correlation Matrix

Table 2: Result of Correlation Matrix

Variables	RGDP	INT	ITR	EXR	M2	MPR
RGDP	1.000					
INT	0.340	1.000				
ITR	0.520	0.270	1.000			
EXR	-0.501	0.350	-0.010	1.000		
M2	0.450	0.390	0.190	-0.130	1.000	
MPR	0.320	0.410	0.320	0.020	0.680	1.000

Source: Researcher`s computation (2025).

The correlation matrix presented in Table 4.2 RGDP (economic growth) is positively correlated with INT (0.340), ITR (0.520), M2 (0.450), and MPR (0.320), indicating that as these variables increase, economic growth tends to increase as well. Among these, the strongest relationship is with ITR, suggesting that interest rates have a notable positive influence on economic growth. However, RGDP is negatively correlated with EXR (-0.501), implying that an appreciation of the exchange rate (or an increase in the value of the local currency relative to others) may negatively affect economic growth. INT (international trade) shows moderate positive correlations with RGDP (0.340) and M2 (0.390), indicating that greater trade openness and higher money supply are associated with increased economic growth. EXR (exchange rates) is negatively correlated

with RGDP (-0.501) and M2 (-0.130), reflecting that changes in the exchange rate can affect both economic growth and the money supply. A stronger exchange rate tends to correlate with slower growth and lower money supply growth.

4.3 Unit Root Test

The unit root test results show a mixed order of integration among the variables. RGDP and INT are non-stationary at levels but become stationary after first differencing, confirming they are integrated of order one, I(1). Similarly, M2 and MPR follow the same pattern, being non-stationary at level but highly significant after differencing, which also classifies them as I(1). In contrast, ITR and EXR are already stationary at level, indicating they are integrated of order zero, I(0). Overall, the findings suggest a combination of I(0) and I(1) variables in the model, which is important for the choice of appropriate econometric techniques.

Table 4.3: ADF and PP Unit Root Test Results

Variables	ADF Level	ADF Differenced	ADF Status	PP Level	PP Differenced	PP Status
RGDP	-2.158	-20.142***	I(1)	-3.299**	-3.299**	I(0)
INT	-2.543	-12.330***	I(1)	-2.640	-12.349***	I(1)
ITR	-3.025**	-3.434**	I(0)	-3.025**	-3.454**	I(0)
EXR	-3.529***	-3.660***	I(0)	-3.690***	-3.529***	I(0)
M2	-1.586	-14.124***	I(1)	-1.586	-14.093***	I(1)
MPR	-0.241	-17.597***	I(1)	-0.021	-17.570***	I(1)

Note: The values of the ADF and PP unit root tests are their respective t-statistics. *** denotes significance at 1% level, ** at 5% level. Source: Researcher's computation (2025) *Eviews 13*

The Vogelsang (Zivot-Andrews) test, which accounts for possible structural breaks, supports these findings. For RGDP, the test confirms non-stationarity at level but strong stationarity after first differencing, reinforcing its classification as I(1). The results therefore indicate that even when structural breaks are considered, RGDP remains stationary only after differencing, consistent with the earlier ADF and PP test outcomes.

Table 4.4: Vogelsang (Zivot-Andrews) Unit Root Test Results

Variables	Level (Vogelsang)	Differenced Status	ZA Coefficient	ZA Statistic	ZA Status
RGDP	-3.681	I(1)	0.861	20.673***	I(1)
INT	-3.924	I(1)	0.922	31.968***	I(1)
ITR	-4.348	I(1)	0.890	26.106***	I(1)
EXR	-3.959	I(1)	0.861	23.160***	I(1)
M2	-2.794	I(1)	0.989	154.594***	I(1)
MPR	-1.251	I(1)	0.996	166.885***	I(1)

Note: The values of the Vogelsang and ZA unit root tests are their respective t-statistics. *** and ** denote significance at 1% and 5% levels, respectively. Source: Researcher's computation (2025).

4.4. Quantile Autoregressive Distributed Lag (QARDL) Bounds Test

Tables 4.5: Result of QARDL Bounds Test

	Value	k
F-statistic	4.899***	6
Critical Value Bounds		
Significance	I(0) Bound	I(1) Bound
10%	2.331	3.253
5%	2.635	3.624
1%	3.273	4.397

*** denotes rejection of the null hypothesis of no co-integration at 1% level. Source: Researcher's computation (2025) Eviews 13.

The results of the Quantile Autoregressive Distributed Lag (QARDL) Bounds Test presented in Table 4.3 show that the F-statistic is 4.899, which is statistically significant at the 1% level. This indicates the rejection of the null hypothesis of no co-integration, meaning that there is a long-run relationship between the variables in the model.

4.5 QARDL Estimation Short-run and Long-run.

Table 4.6: QARDL Estimation Results (Dependent Variable RGDP)

Quantile	ECM	INT	ITR	EXR	M2	MPR
0.1	-0.073*					
SR		-0.088*	-0.020*	0.209*	1.811*	0.009
LR		0.287*	-0.007*	0.998*	8.766*	-0.004
0.2	-0.178*					
SR		-0.265*	-0.003*	0.433*	2.076*	0.035
LR		0.278*	-0.008*	1.055*	7.437*	0.019
0.3	-0.092*					
SR		-0.400*	-0.004*	0.388*	2.992*	0.046
LR		0.289*	-0.009*	1.074*	6.873*	0.004
0.4	-0.156*					
SR		0.167*	-0.004*	0.289*	2.688*	0.006**
LR		0.234*	-0.007*	1.688*	6.137*	0.021**
0.5	-0.164*					
SR		-0.184*	-0.003*	0.347*	2.771*	0.005
LR		0.245*	-0.005*	1.761*	5.822*	0.022***
0.6	-0.179*					
SR		-0.291*	-0.005*	0.329*	2.982*	0.000
LR		0.231*	-0.008*	1.988*	4.607*	0.020***
0.7	-0.188*					
SR		-0.177*	-0.004*	0.393*	2.344*	0.274***
LR		0.188*	-0.009*	1.871*	5.712*	-3.079***
0.8	-0.179*					
SR	0.079	-0.189*	-0.003*	0.355	2.447*	

LR	-5.889	0.288*	-0.015*	0.898*	2.339*	
0.9	-0.223*					
SR		0.108*	-0.019*	-0.003*	0.229	2.310*
LR		-4.190	0.233*	-0.010*	0.777*	2.488*

* Indicates significance at 5%, SR is short-run, LR is long-run. **Source:** Researcher's computation (2025)

The QARDL results in Table 4.6 explore how real GDP (RGDP) responds to key macroeconomic variables, namely international trade (INT), interest rate (ITR), exchange rate (EXR), money supply (M2), and the monetary policy rate (MPR). Overall, the evidence suggests that international trade, money supply, and exchange rate stability tend to support economic growth in both the short and long run, whereas interest rates and monetary policy conditions produce more mixed and sometimes contractionary effects. In the short run, international trade shows a small but significant negative effect on RGDP at the 0.1 quantile (-0.088), which likely reflects short-term adjustment costs associated with trade liberalisation, as domestic industries adapt to increased external competition before longer-term gains materialise. Similarly, interest rates exert a negative impact (-0.020), consistent with Keynesian reasoning that higher borrowing costs discourage investment and consumption, thereby dampening output. By contrast, money supply (M2) has a strong positive short-run effect (1.811), in line with the Quantity Theory of Money, suggesting that liquidity expansion stimulates aggregate demand and economic activity. The exchange rate also contributes positively (0.209), supporting the view that a more favourable currency position enhances export competitiveness and output growth. The error correction terms are negative and statistically significant across all quantiles (e.g., -0.073 at the 0.1 quantile and -0.178 at the 0.2 quantile), confirming a stable long-run equilibrium relationship. However, the speed of adjustment varies, with slower convergence among lower-growth economies and faster adjustment at higher quantiles, implying that weaker-performing economies take longer to recover from shocks. In the long run, international trade, exchange rate, and money supply maintain positive associations with RGDP, consistent with Comparative Advantage theory and monetary expansion effects. However, the monetary policy rate shows a significant negative impact at higher quantiles (-3.086 at the 0.9 quantile), reinforcing the view that tighter monetary conditions can suppress long-term growth, particularly in stronger-performing economies.

4.6 Discussion of Findings

The QARDL estimation results indicate that interest rate variations significantly affect Nigeria's economic growth, with notable differences across quantiles and between the short run and long run. In the short run, higher interest rates are negatively associated with real GDP growth, which is consistent with Keynesian and classical monetary theory that increased borrowing costs reduce investment and consumption. The correlation matrix also supports this inverse relationship. However, quantile estimates show that the negative effect of interest rates weakens and may become neutral at higher levels of economic performance, suggesting that in periods of stronger growth, moderate interest rate increases may help control inflation without substantially harming output. In the long run, the results reveal a positive relationship between interest rates and growth at most quantiles, which can be explained by financial deepening theory, stable interest rate policies may encourage savings, deepen financial markets, and support long-term investment. The

bounds test confirms a long-run cointegrating relationship, while the error correction model (ECM) coefficients are negative and statistically significant across quantiles, implying a stable adjustment back to equilibrium. The adjustment is slower in lower quantiles and faster in higher quantiles, indicating that economies with weaker growth conditions recover more slowly from interest-rate shocks.

The results show that exchange rate movements significantly influence Nigeria's economic growth, though the effects differ between the short run and the long run. In the long run, exchange rate depreciation has a negative effect on GDP growth. This outcome reflects Nigeria's import-dependent structure, where a weaker currency increases the cost of imported inputs, fuels inflation, and disrupts domestic production. This is consistent with structuralist perspectives that exchange rate instability undermines long-term growth in developing economies. In the short run, mild exchange rate depreciation may stimulate growth by improving export competitiveness in line with Purchasing Power Parity (PPP). Nevertheless, the long-run costs outweigh these short-term benefits due to limited export diversification and reliance on imported inputs. The study also finds evidence that exchange rate effects can be positive at certain quantiles, implying that a stable and competitive exchange rate may support growth through improved trade balance and increased foreign investment. The correlation matrix further supports the conclusion that sustained exchange rate instability is harmful to growth.

The study finds strong evidence that international trade positively affects economic growth in Nigeria in both the short run and the long run. The correlation matrix reveals a positive relationship between trade openness and GDP growth, and the QARDL results confirm that higher trade intensity improves economic performance across multiple quantiles. In the short run, trade expansion promotes output by increasing production, foreign exchange earnings, and domestic activity, which is consistent with classical trade theory and the adjustment process following trade liberalization. In the long run, the positive and significant trade-growth relationship supports David Ricardo's Comparative Advantage Theory. Sustained openness facilitates technology transfer, human capital development, efficiency improvements, and structural transformation, which aligns with broader empirical evidence that trade-driven economies tend to achieve more resilient and faster growth than closed economies.

4.7 Diagnostic Test

The post-estimation diagnostic results in Table 7 show that the Jarque–Bera test for normality has a statistic of 8.924 and a probability value of 0.015. This means that, at the 5% significance level, the null hypothesis of normality is rejected, implying that the residuals of the model are not normally distributed. In contrast, the serial correlation test reports an F-statistic of 0.218 with a probability value of 0.842, which is well above 0.05. Therefore, the null hypothesis of no serial correlation is not rejected, indicating that there is no significant autocorrelation in the residuals. Finally, the Ramsey RESET test for model specification yields an F-statistic of 1.383 with a probability value of 0.170. Since this value is greater than 0.05, the null hypothesis that the model is correctly specified is not rejected. This suggests that the model does not suffer from omitted variables or incorrect functional form, and the overall specification is appropriate for the analysis.

Table 4.7: Results of Diagnostics Tests

Test Statistic	Results	Prob.
Normality: Jarque-Bera	8.924	[0.105]
Serial Correlation: F(2,86)	0.218	[0.842]
Ramsey Reset F-stat(1,87)	1.383	[0.170]

Source: Researcher`s computations (2025) *Eviews 13*

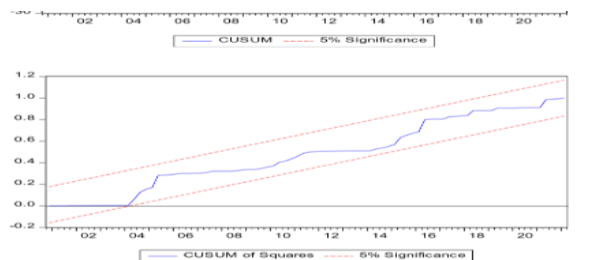


Fig 4.1: Cumulative Plot

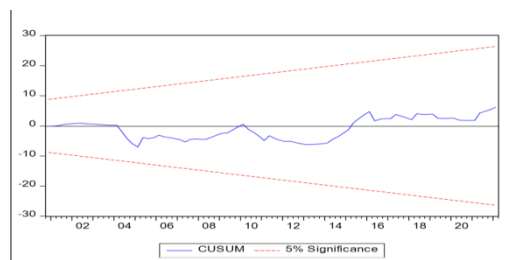


Fig 4.2: Cumulative sum of Squares

5. Conclusion and Recommendations

5.1 Conclusion

The study achieved its objectives by analyzing the effects of monetary policy and international trade on economic growth in Nigeria. Overall, the results confirm that international trade, exchange rate stability, and money supply expansion play important roles in promoting economic growth in both the short run and the long run. These findings align with theories such as comparative advantage, monetary expansion, and Purchasing Power Parity, indicating that sustained trade openness and more stable exchange rate conditions support improved economic performance. The study also shows that the effects of monetary policy especially interest rates are not uniformly growth-enhancing over time. The negative long-run relationship between MPR and RGDP suggests that excessively high interest rates may restrain investment and consumption, which are essential for long-term growth. Additionally, the differing adjustment speeds in the ECM indicate that the Nigerian economy (and its sub-samples across quantiles) responds to shocks and returns to equilibrium at varying rates. This supports the view that economies at lower growth levels may adjust more slowly, while relatively stronger economies may restore equilibrium faster due to better institutional capacity and resilience.

5.2 Recommendations

Based on the findings, the study recommends the following for policy and decision-making in Nigeria:

1. **Support trade liberalization with adjustment support:** Policymakers should continue trade liberalization while recognizing that full benefits may take time. To reduce early-stage disruptions in domestic industries, targeted interventions such as investment in

infrastructure and human capital should be strengthened to enhance industrial adjustment and competitiveness.

2. **Adopt a balanced approach to interest rates:** While inflation control is important, interest rate policy must be cautious. Excessively tight monetary policy that pushes rates too high can suppress growth by lowering consumption and discouraging investment. A more flexible monetary policy approach is therefore recommended, especially during periods of economic uncertainty.
3. **Prioritize exchange rate stability:** Exchange rate stability should remain a major policy priority because it improves trade competitiveness and can attract foreign investment. Policymakers should aim to maintain a balanced exchange rate that supports exports while minimizing excessive volatility.

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